

In the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1 1. (Previously Presented) A method for reducing noise in a
2 sampled acoustic signal, comprising:
3 receiving a stream of sampled acoustic signals;
4 digitizing each sampled acoustic signal thereby forming
5 digital samples;
6 selecting a fixed number of digital samples;
7 multiplying the digital samples by a windowing function;
8 computing the fast Fourier transform of the selected windowed
9 digital samples to yield transformed windowed signals;
10 selecting half of the transformed windowed signals;
11 calculating a power estimate of the transformed windowed
12 signals;
13 calculating a smoothed power estimate by smoothing the power
14 estimate over time using the equation:

$$P^t(i) = (1-a) P^{t-1}(i) + a P(i)$$

16 where: $P^t(i)$ is the smoothed power estimate for a current time
17 sample to be calculated for the i -th FFT point; $P^{t-1}(i)$ is the
18 smoothed power estimate for an immediately prior time sample for
19 the i -th FFT point; $P(i)$ is the calculated power estimate of the
20 transformed windowed signals for the i -th FFT point; and a is an
21 experimentally chosen pre determined value called the smoothing
22 factor;
23 calculating a noise estimate;
24 calculating a gain function from the noise estimate and the
25 smoothed power estimate;

26 calculating a transformed speech signal by multiplying the
27 gain function with the transformed windowed signal;
28 calculating an inversed fast Fourier transform of the
29 transformed speech signal to yield a sampled speech signal; and
30 adding the sampled speech signal to a portion of the speech
31 signal of a previous frame.

1 2. (Original) The method of Claim 1, wherein the fixed
2 number of samples is thirty-two.

1 3. (Original) The method of Claim 1, wherein the windowing
2 function is a hanning window function.

4 to 8. (Canceled)

1 9. (Previously Presented) A system for reducing noise in an
2 acoustical signal comprising:
3 a sampler for obtaining discrete samples of the acoustical
4 signal;
5 an analog to digital converter coupled to the sampler an
6 operable to convert the analog discrete samples into a digitized
7 sample;
8 a noise suppression circuit coupled to the analog to digital
9 converter and operable to:
10 receive the digitized samples;
11 select a fixed number of digitized samples;
12 multiply the digitized samples by a windowing function;
13 compute the fast Fourier transform of the windowed
14 digitized samples to yield transformed windowed signals;
15 select half of the transformed windowed signals;
16 calculate a power estimate of the transformed windowed
17 signals;

18 calculate a smoothed power estimate by smoothing the power
19 estimate over time using the equation:

$$20 \quad P^t(i) = (1-a) P^{t-1}(i) + a P(i)$$

21 where: $P^t(i)$ is the smoothed power estimate for a current time
22 sample to be calculated for the i -th FFT point; $P^{t-1}(i)$ is the
23 smoothed power estimate for an immediately prior time sample for
24 the i -th FFT point; $P(i)$ is the calculated power estimate of the
25 transformed windowed signals for the i -th FFT point; and a is an
26 experimentally chosen predetermined value called the smoothing
27 factor;

28 calculate a noise estimate;
29 calculate a gain function from the noise estimate and the
30 smoothed power estimate;
31 calculate a transformed speech signal by multiplying the
32 gain function with the transformed windowed signal;
33 calculate an inversed fast Fourier transform of the
34 transformed speech signal to yield a sampled speech signal; and
35 add the sampled speech signal to a portion of the speech
36 signal of a previous frame.

1 10. (Original) The system of Claim 9, wherein the fixed
2 number of samples is thirty-two.

1 11. (Original) The system of Claim 9, wherein the windowing
2 function is a hanning window function.

12 to 22. (Canceled)